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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/659,898	09/11/2003	Andrew J. Kuzma	42.P13639D	4189

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EXAMINER

DOLAN, JENNIFER M

ART UNIT	PAPER NUMBER
2813	

DATE MAILED: 02/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/659,898

Applicant(s)

KUZMA, ANDREW J.

Examiner

Jennifer M. Dolan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 October 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 19-22 and 27-29 is/are pending in the application.
- 4a) Of the above claim(s) 19-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 27-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/17/05.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Claims 19-22 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 3/21/05.

Claim Rejections - 35 USC §102/ 103

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-6 and 27-29 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over U.S. Patent No. 6,668,000 to Choa.

Regarding claims 1 and 27, Choa discloses a method comprising: optically coupling (figures 4 and 5) a test structure (340) to a device (light emitting devices; figures 4 and 5) on a wafer (380), the test structure included on the wafer (figures 4 and 5), the test structure comprising a first region (cladding material directly outside of trench 340), a second region (air region inside trench 340), and an interface between the two (figures 4 and 5), the second region comprising a material different from a material of the first region (see column 4, line 50 – column 5, line 15), wherein the test structure is optically coupled to the device in a manner to allow the interface to direct a light beam emitted from the device in a direction different from an original direction of the emitted light beam (figures 4 and 5; column 4, lines 45-55); and detecting and evaluating the light beam (column 4, lines 9-55). Insofar as the term ‘removable’ only suggests that the test structure is capable of being removed, and not that the structure is actually removed (note that there is no recitation of an actual step of removing the test structure – the requirement is only that it is ‘removable’), and since it is possible to remove the test structure (scattering trench 340) from the laser structure by means reasonably known in the art and non-damaging to the operation of the completed device (i.e., filling the scattering trench to remove the scattering trench structure; removing the structure containing the trench and re-depositing the layer or cleaving off the test structure, resulting in a shorter, but functional laser device), Choa alone is considered to anticipate the claimed subject matter of claims 1 and 27.

Insofar as one might interpret the limitation of “removably optically coupling” to require some sort of suggestion in the prior art of actually removing the structure, Choa discloses several factors suggesting desirability or possibility of removing the test structure, but does not explicitly teach removing the test structure. These factors include: Choa discloses that the test structure is

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only used for wafer-level device testing prior to singulation, and hence, no longer serves any purpose in the functional, packaged device (see Choa, column 2, lines 1-31); and the presence of the testing trench structure scatters some portion of the output light away from the emitting facet of the functional device, thus causing a slightly lower light output per current applied to the device (see Choa, column 2, lines 18-25; column 4, lines 45-67). Since it has been held that “omission of an element and its function is obvious if the function of the element is not desired” *Ex parte Wu*, 10 USPQ 2031 (Bd. Pat. App. & Inter. 1989); *In re Larson*, 340 F.2d 965, 144 USPQ 347 (CCPA 1965); *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975), it would be obvious to a person skilled in the art that the test structure described by Choa as being only used during wafer-form testing, not really serving any purpose thereafter, and causing a detrimental effect of diverting some of the light output from the emitting facet would desirably be removed or “removable.”

Regarding claim 2, Choa discloses optically coupling the test structure to a side-emitting laser (column 4, lines 44-55).

Regarding claims 3 and 28, Choa discloses reflecting the beam from the interface between the first and second regions, where the regions are comprised of materials having different refractive indexes (figures 4 and 5; column 4, line 60 – column 5, line 15; trenches 340 are etched, and have an index of 1).

Regarding claim 4, Choa discloses coupling the test structure to a back facet of the device (for a simple fabry-perot laser, facets 320 and 330 are identical, and the laser emits in both directions; hence, either can be considered to be the “rear” facet of the device).

Regarding claims 5, 6, and 29, Choa discloses positioning a light detector to receive the beam emitted from the device, and detecting a frequency and intensity of the beam (column 4, lines 9-20; L/I testing corresponds with intensity, and “wavelength” or “mode” testing with frequency; also, it is implicit that the detector must be positioned to receive the beam in order to make these measurements).

5. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choa in view of U.S. Patent No. 6,459,716 to Lo et al.

Choa fails to disclose that the detector is a photodiode integrated into the test structure.

Lo discloses a photodiode structure (260) integrated into the light re-directing structure portion (see figure 4) and integrated onto the same wafer as the laser and test structure (see figure 4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Choa by using a photodiode as the photodetector, and integrating such a structure with the test structure, as suggested by Lo. The rationale is as follows: A person having ordinary skill in the art would have been motivated to use substantially the same active layer structure as the laser (thus resulting in a photodiode) and integrate such a structure into the same wafer structure as the laser and test structure, because Lo shows that integrated photodetectors intended for detecting the laser light output can be produced with the same epitaxial layer structure as the laser diode (see Lo, column 4, line 58 – column 5, line 14), thus enabling the production of a suitable laser and photodetector with minimal processing time

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and fabrication complexity, as is appreciated by one having ordinary skill in the art. Since Lo further illustrates that the photodetector can be integrated directly with a light redirecting structure (see Lo, figure 4), it is reasonable for a person having ordinary skill in the art to apply these teachings of Lo to the light-redirecting test structure of Choa.

Response to Arguments

6. Applicant's arguments filed 10/13/05 have been fully considered but they are not fully persuasive.

The Applicant argues that Choa, Komazaki, and Boudreau all disclose test structures that cannot reasonably be considered "removable"

While the Examiner agrees with the Applicant's characterization of the test structures of Komazaki and Boudreau as being "non-removable", as the devices would no longer function as intended without the presence of such test structures, the Examiner does not agree that the test structure in Choa is non-removable. The scattering trench of Choa only fulfills a purpose during wafer-stage testing (Choa, column 2, lines 1-34), and is essentially non-functional or even parasitic in the finished device (see Choa, column 4, line 65 – column 5, line 14). Hence, the removal of such a structure would not affect (or even would slightly improve) the performance of the completed device. The Examiner notes that the test structure of Choa is *capable* of being removed without causing the laser to cease functioning as intended, by: filling or impeding the scattering trench, re-depositing the layer overlying the active layer such that it does not contain a scattering trench, or cleaving the device into a shorter length laser. Since the Applicant has not clarified in the claims the means by which the test structure is to be removed or whether the

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structure must actually be removed (rather than simply being capable of being removed), the Examiner maintains that the test structure in Choa is considered "removable."

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer M. Dolan whose telephone number is (571) 272-1690. The examiner can normally be reached on Monday-Friday 8:30am-5:00pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead, Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer M. Dolan
Examiner
Art Unit 2813

jmd


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